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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,545	09/21/2001	Deep K. Buch	42390P11711	5908

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EXAMINER

OPIE, GEORGE L

ART UNIT	PAPER NUMBER
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2126

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DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/960,545

Examiner

George L. Opie

Applicant(s)

Deep Buch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 1/22/02
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ☐ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ☐ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ☐ is/are objected to.
- 8) ☐ Claim(s) ☐ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ☐ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ☐ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) ☐.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☒ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 1/2/02
- 16) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2/02
- 17) ☐ Interview Summary (PTO-413) Paper No(s). ☐
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☒ Other: Text Doc for USP6,351,778

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DETAILED ACTION**1. Request for copy of Applicant's response on floppy disk:**

Please help expedite the prosecution of this application by including, along with your amendment response in paper form, an electronic file copy in WordPerfect, Microsoft Word, or in ASCII text format on a 3½ inch IBM format floppy disk.

Please include all pending claims along with your responsive remarks. Only the paper copy will be entered -- your floppy disk file will be considered a duplicate copy. Signatures are not required on the disk copy. The floppy disk copy is not mandatory, however, it will help expedite the processing of your application. Your cooperation is appreciated.

2. Claim Rejections - 35 U.S.C. § 112**3. The following is a quotation of the second paragraph of 35 U.S.C. 112:**

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

As to claim 1, the recitation of a "yielding count" lacks antecedent basis. There is no definition or support for the referenced "yielding count" term. Claim 1 is vague and indefinite.

As to claims 2, 5 and 7-9, the recitation of a "yielding count" lacks antecedent basis. The line of claims from which the given claims depend fails to provide a definition or support for the referenced "yielding count" term. Hence, the given claims are vague and indefinite.

As to claim 11, the recitation of a "yielding count" lacks antecedent basis. There is no definition or support for the referenced "yielding count" term. Claim 11 is vague and indefinite.

As to claims 12-13, the recitation of a "yielding count" lacks antecedent basis. The line of claims from which the given claims depend fails to provide a definition or support for the referenced "yielding count" term. Hence, the given claims are vague and indefinite.

As to claim 18, the recitation of a "yielding count" lacks antecedent basis. There is no definition or support for the referenced "yielding count" term. Claim 18 is vague and indefinite.

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As to claim 19, the recitation of a "yielding count" lacks antecedent basis. The independent claim from which claim 19 depends fails to provide a definition or support for the referenced "yielding count" term. Hence, claim 19 is vague and indefinite.

As to claim 21, the recitation of a "yielding count" lacks antecedent basis. There is no definition or support for the referenced "yielding count" term. Claim 21 is vague and indefinite.

As to claim 22, the recitation of a "yielding count" lacks antecedent basis. The independent claim from which claim 22 depends fails to provide a definition or support for the referenced "yielding count" term. Hence, claim 22 is vague and indefinite.

As to claim 24, the recitation of a "yielding count" lacks antecedent basis. There is no definition or support for the referenced "yielding count" term. Claim 24 is vague and indefinite.

As to claims 25, 28 and 30, the recitation of a "yielding count" lacks antecedent basis. The line of claims from which the given claims depend fails to provide a definition or support for the referenced "yielding count" term. Hence, the given claims are vague and indefinite.

4. The U.S. Patents used in the art rejections below have been provided as text documents which correspond to the U.S. Patents. The relevant portions of the text documents are cited according to page and line numbers in the art rejections below. For the convenience of Applicant, the cited sections are highlighted in the *text documents*.

5. Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Admitted Prior Art (APA) from the Application background in view of Orton et al. (U.S. Patent 6,351,778).

As to claim 1, the APA teaches a method (algorithm to ensure mutually exclusive access to a shared resource) comprising:

for a first thread, entering a processing queue for obtaining permission to enter a critical section of code (thread I ... critical section ... enters the processing queue)

determining if a second thread exists, the second thread executing the critical section of code concurrently with the first thread entering the processing queue (condition test ... thread j is currently executing) and

if the second thread is executing the critical section, then testing for the second thread to complete (second condition ... if thread j has completed) until one of the following occurrences:

the second thread completes (line 10 ... thread j completes).

The APA does not explicitly disclose the additional testing condition – a yielding count.

Orton teaches “time-outs can also be set on the condition wait operations to limit the time a thread will wait for the condition”, p19 10-12 which corresponds to the limitation of a yielding count to terminate the testing. It would have been obvious to combine Orton’s time-out teachings with the APA because this mechanism provides threads a means to “limit the time spent waiting”, p30 24-51 on the desired object, and thus each of the processes in the system would have a guard against an unbounded idle/wait state.

As to claim 2, Orton (p19 10-12) teaches the mechanism will “limit the time a thread will wait”, and from this it would naturally follow that the thread will then exit the processing queue.

As to claims 3-4, Orton teaches that the system has means for thread resumption, p13 28-49, and from this, it would have been obvious to specify that the OS will schedule an expired thread to resume its processing. It would have been obvious to combine Orton’s teachings with the APA because a thread that has yielded its position in the queue without being processed can be identified so that it avoids starvation and is “caused to resume execution with an indication” of its requirements.

As to claim 5, the APA teaches if the second thread completes before the yielding count expires, then executing the first critical section of code (thread I will be executed if ... second condition ... thread j has completed).

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As to claim 6, the APA teaches if the second thread does not exist, then executing the first critical section of code (first condition ... thread I is the only thread running).

As to claims 7-9, Orton (p30 24-51) teaches a "time-out value can be specified" and this limit would be based on the parameters as recited. It would have been obvious to combine Orton's teachings with the APA because the wait/yield time will factor the number of processes in relation to the system processors for determining optimal timing-bounds based on system conditions/resources.

As to claim 10, the APA teaches the concept of two processes each contain a "section of code in which a shared resource is accessed" which corresponds to the critical section of code includes the same code in both the first and the second thread.

As to claim 11, the APA teaches a method (algorithm to ensure mutually exclusive access to a shared resource) comprising:
for a first thread, entering a processing queue for obtaining a lock on a shared resource in a first critical section of code (thread I ... critical section ... enters the processing queue) by checking the status of shared variables existing in a memory (conditions and flag variables) the shared variables including a status flag;
determining if a second thread exists, the second thread executing a second critical section of code concurrently with the first thread entering the processing queue, the second critical section corresponding to the second thread (condition test ... thread j is currently executing) and
if the second thread exists, then testing for the second thread to relinquish the lock on the shared resource by testing the status flag (second condition ... if thread j has completed) the testing to be performed until one of the following occurrences:
The APA does not explicitly disclose the additional testing condition – a yielding count.

Orton teaches "time-outs can also be set on the condition wait operations to limit the time a thread will wait for the condition", p19 10-12 which corresponds to the limitation of a yielding count to terminate the testing. It would have been obvious to combine Orton's time-out teachings with the APA because this mechanism provides threads a means to "limit the time spent waiting", p30 24-51 on the desired object, and thus each of the processes in the system would have a guard against an unbounded idle/wait state.

As to claim 12, see the rejection of claim 5 supra.

As to claims 13-14, see the rejections of claims 2-3 respectively.

As to claim 15, note the discussion of claim 11 supra. The limitations in claim 15 are functionally equivalent to the limitations in claim 11, but for the repetition clause which is met by the APA's "while-loop" taught in the Peterson algorithm.

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As to claim 16, Orton (p25 14-39) teaches the second cache is larger than the first cache. It would have been an obvious design choice to add the well-known cache provisions to the APA's system because cache memories furnish fast access to data, and the size is determined on a cost/benefit basis.

As to claim 17, the APA teaches "thread j resets the flag variable".

As to claims 18-19, note the rejections of claims 1-2 above. Claims 18-19 are the same as claims 1-2, except claims 18-19 are computer program product claims and claims 1-2 are method claims.

As to claim 20, note the rejection of claim 6 above. Claim 20 is the same as claim 6, except claim 20 is a computer program product claim and claim 6 is a method claim.

As to claims 21-22, note the rejections of claims 1-2 above. Claims 21-22 are the same as claims 1-2, except claims 21-22 are apparatus claims and claims 1-2 are method claims.

As to claim 23, note the rejection of claim 6 above. Claim 23 is the same as claim 6, except claim 23 is an apparatus claim and claim 6 is a method claim.

As to claims 24-30, see the discussions of claims 1-7 supra. Claims 24-30 are functionally equivalent to claims 1-7, but claims 24-30 employ means plus function language in apparatus claims and claims 1-7 are method claims.

7. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure. Specifically, the below reference(s) will also have relevancy to one or more elements of the Applicant's claimed invention as follows:

U.S. Patent No. 6,766,349 to Belkin which teaches the maximum time out condition to govern thread processing;

U.S. Patent No. 5,781,775 to Ueno which teaches the deactivation of a waiting process and re-initiating its execution.

8. Contact Information:

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

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Status information for published applications may be obtained from either Private-PAIR or Public-PAIR.

Status information for unpublished applications is available through Private-PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

- ☐ All responses sent by U.S. Mail should be mailed to:
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450
 - ☐ Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist). All hand-delivered responses will be handled and entered by the docketing personnel. Please do not hand deliver responses directly to the Examiner.
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- All OFFICIAL faxes will be handled and entered by the docketing personnel. The date of entry will correspond to the actual FAX reception date unless that date is a Saturday, Sunday, or a Federal Holiday within the District of Columbia, in which case the official date of receipt will be the next business day. The application file will be promptly forwarded to the Examiner unless the application file must be sent to another area of the Office, e.g., Finance Division for fee charging, etc.
- ☐ Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at **(703) 305-9600**.
 - ☐ Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Opie at (703) 308-9120 or via e-mail at *George.Opie@uspto.gov*. Internet e-mail should not be used where

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sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the Applicant. Sensitive data includes confidential information related to patent applications.

Note: Due to the PTO's move to Alexandria, the above-listed examiner's telephone number will be changed. As of 17 October 2004, Mr. Opie can be reached at (571) 272-3766.


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SUPERVISORY PATENT EXAMINER
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